

**CLAIMS**

1. A system for detecting characteristics of an elastic structure (13, 22, 23, 32, 33,  
5 93, 1202, 1302, 1402), said structure being provided with at least one sensor  
(111, 112, 14, 211, 212, 311, 312, 911, 1211, 1311, 1411) and said system  
comprising at least one detector (16, 416, 516, 916, 1316, 1416),  
characterised in  
that said sensor comprises a deformable member, which upon deformation  
10 generates a signal convertible to a signal representing said characteristic, said  
sensor further comprises a passive transmitter and said detector a receiver for  
receiving said signal representing said characteristic.
2. The system of claim 1, wherein said structure is a substantially cylindrical  
15 rotating structure.
3. The system of claim 1, wherein said sensor is arranged on or inside said  
structure.
- 20 4. The system of claim 1, wherein the sensor is arranged in one of or several of a  
longitudinal, radial or transversal direction of the structure.
5. The system of any of preceding claims, wherein said sensor is at least one of a  
piezoelectric, magnetic or magneto-elastic material.  
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6. The system of claim 4, wherein the sensor is arranged to provide one or several  
of absolute linear velocity or skid characteristic of the structure.
7. The system of claim 1, wherein said structure comprises an oblong structure  
30 passing through a pressing arrangement, said conveyer being provided with a  
piezo-electrical sensor and/or a magneto-elastic material, sensor.
8. The system of claim 1, using a magnetic detection by creating a magnetic path  
formed as an appropriate coil on the structure, which is used for generating a  
35 pulsed magnetic field, and detected by an antenna arranged in connection with  
the structure.

9. The system of claim 8, wherein said signal receiver is arranged as a coil being charged when a magnetic field is generated by said coil in said structure.
- 5 10. The system of claim 1, wherein said sensor is a magneto-elastic material, which varies magnetization when deformed and returns to its initial magnetization when the deformation relaxes to equilibrium and said detector is a magnetic detection on the body of the vehicle.
- 10 11. The system of claim 8, wherein the sensor elongates during a time period, whereby a part of the structure that contains the sensor is in contact with the surface, whereby during said time period, an electric signal is created, and a linear velocity of rotation is obtained if a length of the sensor is known by dividing this length by the duration of the voltage/current pulse.
- 15 12. The system of claim 8, wherein additional information is provided by a frequency at which pulses occur due to the rotation of the structure, both related to each other and to a linear velocity of the structure motion, and a difference in linear velocity of the structure calculated from the pulse duration and from the frequency of structure rotation varying in time indicates skid.
- 20 13. The system of claim 1, wherein the sensor comprises a bar code in the structure.
14. The system as claimed in any of the preceding claims, wherein the sensor is formed as a strip, a foil, a thread, a film or a particle or the like.
- 25 15. The system as claimed in any of the preceding claims, wherein the structure comprises a tyre, a roll, a roller, a cylinder, a delivery bowl, rubber-covered cylinder, drum, or a hole cylinder.
- 30 16. The system as claimed in any of the preceding claims, wherein the structure is a wire, or a sheet material, a fabric, a cloth, a printing paper, paper money, bank notes or the like.
- 35 17. A method of detecting characteristics of an elastic structure, the method comprising the steps of:
- providing said structure with at least one sensor, said sensor comprising a deformable member, which upon deformation generates a signal convertible

to a signal representing said characteristic, and

- providing at least one detector for detecting said signal.

- 5 18. A Sensor arrangement for incorporation into a structure and for providing at least one physical characteristic of said structure subjected to a force under a motion, said sensor comprising an element energized through physical change of said detector and for providing a signal to a passive transmitting element receivable by a receiver.
- 10 19. The sensor of claim 18, wherein said passive transmitting element is a conductor extending from ends of said sensor.
20. The sensor of claim 18, wherein said conductor interacts with a receiving conductive element and transmits said signal capacitively.
- 15 21. The sensor of claim 18, wherein said conductor is connected to each end of said detector.
22. The sensor of claim 19, wherein said receiving conductive element is a
- 20 conductive plate.
23. The sensor of claim 18, wherein said passive transmitting element is a coil connected to ends of said sensor.
- 25 24. The sensor of claim 22, wherein said coil interacts with a receiving coil and transmits said signal inductively.
25. The sensor according to any of claims 18-24, comprising one or several of a piezoelectric or magneto-elastic material.
- 30 26. The sensor of claim 24, wherein said magneto-elastic detector constitutes the transmitting element.
27. The sensor according to any of claims 18-25, wherein said receiving element is
- 35 connected to signal processing unit comprising an amplifier, an analogue-digital converter and a signal processor.

28. The sensor according to any of claims 18-25, being provided in said structure adjacent to one or several similar detectors.

29. The sensor of claim 27, being arranged side by side.

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30. The sensor of claim 28, being arranged overlapping.

31. The sensor of claim 18, being bended providing two shanks, one of which can be subjected to a force.

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32. The sensor of claim 18, using a differential technique to measure temperature variations.

33. A system for measuring the dynamic pressure between rolls of a roll press comprising rotating rolls and a conveyer, the system comprising:

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- a passive sensor, having a passive transmitting antenna, incorporated in said conveyer,
- a receiver antenna for receiving transmissions from said passive antenna, and
- a signal processor connected to said receiver antenna for handling said received signal corresponding to the physical characteristics of said passive sensor.

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